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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,864	01/19/2004	Robert T. Froebel	BUR920030140US1	1863
30678 7590 08/30/2007 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20036			EXAMINER AKANBI, ISIAKA O	
			ART UNIT 2886	PAPER NUMBER
			MAIL DATE 08/30/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/707,864

Applicant(s)

FROEBEL ET AL.

Examiner

Isiaka O. Akanbi

Art Unit

2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,7 and 10-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,7 and 10-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 August 2007 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11 -16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida (2001/0024278 A1).

As regard to claims 11 and 14, Yoshida discloses a method for searching and aligning alignment marks formed on a substrate in a diffraction pattern alignment system comprising of the following:

locating a segment of a Y mark in an X mark, illuminating the segment of a Y mark in an X mark with a Y-alignment signal source having a width Z (figs. 16A-C): $VMY=VS_Y$ (i.e. the size of beam radiation that completely covered and detect the region of interest) (pars. 0068, 0087, 0170), measuring received signal strength of the diffraction pattern at a first signal detector,

moving the X mark in an X-direction, repeating the illuminating, measuring and moving until the received signal strength of the diffraction pattern at the first signal detector is zero, determining a location of an approximate center of the segment of a Y mark in an X mark as a maximum of the measured received signal strength, illuminating the X mark with the X-alignment signal source, detecting multiple aligned positions received at a second signal detector as a result of illuminating the X mark, searching the multiple aligned positions detected for a single aligned position in the X direction that corresponds to the location of the approximate center of the segment of a Y mark in an X mark and selecting an aligned position of the X mark in the X-direction in accordance with the single aligned position that corresponds to the location of the approximate center of a Y mark in an X mark (fig. 1 and fig. 16)(page 8, par. 0094-0096 and 0170)(page 1, par. 0009)(page 2, par. 0017-0018 and par. 0020).

Wherein the approximate center of a Y mark in an X mark is further determined from the width Z of the Y-alignment signal source and a location of the maximum of the measured received signal strength (fig. 16A-C)(pars. 0087, 0170).

As to claims 12, Yoshida discloses wherein moving the X mark in an X-direction is performed by moving the X mark in relation to the Y-alignment signal source by a specified amount in the X-direction until the Y-alignment signal source has passed the segment of a Y mark in an X mark (fig. 1).

As to claims 13 and 16, Yoshida discloses wherein selecting the aligned position occurs when the maximum of the received signal strength is greater than or equal to a predetermined threshold (page 2, par. 0017-0018).

As to claim 15, Yoshida discloses wherein moving the Y mark in the Y-direction is performed by moving the Y mark in relation to the X-alignment signal source by a specified

amount in the Y-direction until the X-alignment signal source has passed the segment of an X mark in a Y mark (fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-5, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida (2001/0024278 A1) in view of the Applicant's Admitted Prior Art (A.P.A).

Regarding to claims 1, 4-5, 7 and 10, Yoshida teaches of a system of alignment marks formed on a substrate, the substrate to be used in a photolithographic system having first and second alignment signal sources (fig. 1: 10,13) and the alignment marks and signal detectors (fig. 1: 14,16,18), comprising a first region (fig. 2: MX) configured to provide a first signal to the first signal detector (14/16/18) in response to the first alignment signal source having a width Z (figs. 16A-C): $VMY=VSY$ (i.e. the size of beam radiation that completely covered and detect the region of interest) and a second region (fig. 2: MY) configured to provide a second signal to the second signal detector (14/16/18) in response to the second alignment signal source having a width Z (figs. 16A-D: $VMY=VSY$)(par. 0170), wherein the first signal determines multiple first coordinates of an aligned position of the substrate, the second signal determines multiple second coordinates of an aligned position of the substrate, and the substrate is in a coarse aligned position with the photolithographic system when one of the multiple first coordinates and

one of the multiple second coordinates correspond to a maximum received signal strength at the first signal detector and the second signal detector, respectively (fig. 1)(page 5, par. 0064), wherein the first region and the second region are an X mark diffraction pattern and a Y mark diffraction pattern, respectively (fig. 2)(page 5, par. 0064) and a segment of a Y mark in the X mark and the Y mark diffraction pattern further comprises a segment of an X mark in the Y mark (fig. 2 and fig. 16)(page 5, par. 0064-0069), a segment of (i.e. a Y mark and a segment of the X mark) are removed/extracted, each segment removed corresponds to regions of the X mark and Y mark that cause false alignments (figs. 16A-C)(pars. 0087, 0170) and Yoshida further discloses determining entire Y mark in the X mark (figs 16A-C) (which encompass an approximate center of a Y mark in the X mark or an approximate center of a X mark in the Y mark) from the width Z of the first alignment signal source and the maximum received signal strength at the first signal detector (pars. 0087, 0170).

Yoshida is silent regarding replacing segment of the Y mark and segment of the X mark that are removed by segments of a different orientation than the X mark and the Y mark (i.e. located from $\pm 45^\circ$ to $\pm 90^\circ$ relative to the X mark and the Y mark).

Applicant discloses (page 1, par. 0004) that removal of alignment marks (i.e. X and Y) is a well known in the art of coarse/rough alignment. Therefore it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to remove a segment of (i.e. a Y mark and a segment of the X mark) that corresponds to regions of the X mark and Y mark that cause false alignments for the purpose of potentially removing large errors during coarse alignment to enables fine alignment systems to efficiently capture alignment marks on the substrate during fine alignment process with accuracy. Further it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to replaced the segment of the Y mark and segment of the X mark that are removed by segments of a different

orientation than the X mark and the Y mark for the purpose of performing fine alignment or exposure process with accuracy.

Response to Arguments

Applicant's arguments/remarks, see pages 7-10, filed on 08 August 2006, with respect to the rejection(s) of claim(s) 1, 4-5, 7 and 10-16 under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) have been fully considered but are not persuasive. Therefore, upon further consideration, a rejection is made in view of claim amendment.

In response to Applicant's arguments that Yoshida nowhere discloses, as amended independent claims 1, 11 and 14 recite "wherein an approximate center of a (i.e. Y mark in the X mark or X mark in the Y mark) is determined from the width Z of the first alignment signal source and the maximum received signal strength at the (i.e. first or second) signal detector, it is respectfully pointed out to applicant that this argument is not persuasive as Yoshida clearly disclose in (i.e. the size of beam radiation that completely covered and detect the region/area of interest) (pars. 0068, 0087, 0170), and shows in (figs. 16A-C).these limitations. As such, the claims are still rejected as shown in the detail above.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

August 26, 2007



TARIFUR CHOWDHURY
SUPERVISORY PATENT EXAMINER